User's Manual

Model MY40
Insulation Resistance Tester

Thank you for purchasing the Yokogawa M&C MY40 Insulation Tester.
To optimize all the functions of the instrument, please read this manual thoroughly before operating it.

Store this manual in a safe place for future reference.

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YOKOGAWA ◆
Yokogawa M&C Corporation

IM MY40-E
2nd Edition: July, 2001

1. Safety Precautions

Always observe the following instructions. Failure to do so may result in electrical shock or other dangers that may lead to serious injury or the loss of life.
Yokogawa M&C Corporation is in no way liable for any damage resulting from the user's mishandling of the tester.
For safe use of this tester, the following safety symbols are used in the user's manual:

⚠ WARNING

This indicates that the operator must refer to an explanation in the user's manual in order to avoid the risk of serious injury or the loss of life.

⚠ CAUTION

This indicates that the operator must refer to an explanation in the user's manual in order to avoid the risk of injury or damage to the tester.

Note

This provides important information for handling the tester and clarifies tester functions.

The following symbols are used on the MY40 tester.

⚠ Danger! Handle with Care.

This symbol indicates that the operator must refer to an explanation in the user's manual in order to avoid risk of injury or death of personnel or damage to the tester.

⚠ High-voltage Terminal

This symbol indicates a dangerous voltage level (terminals with voltages exceeding 1000 volts must be so marked). Never touch the terminals.

~ AC Voltage

This symbol indicates the presence of an AC voltage.

⧈ Double Insulation

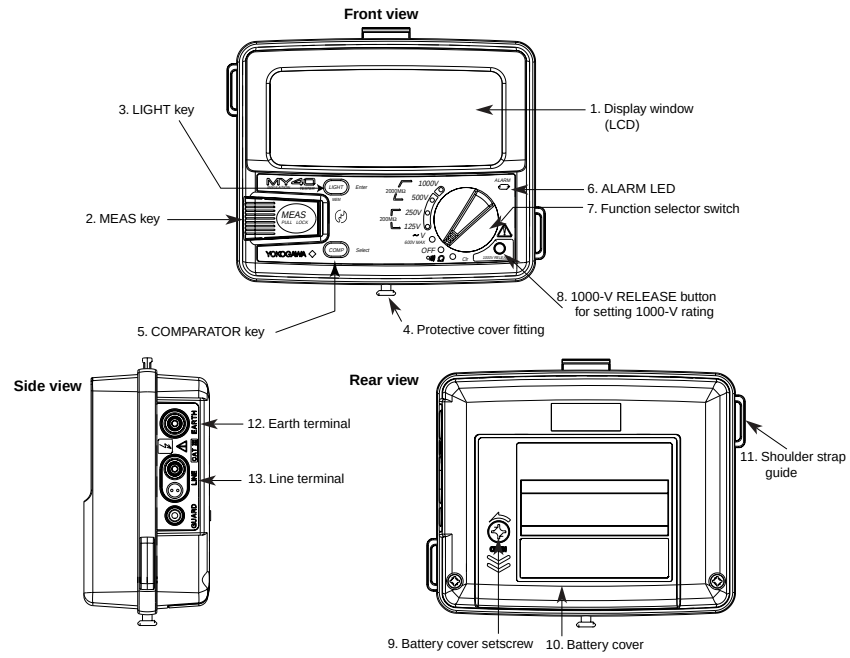
This symbol indicates double insulation.

⚠ WARNING

■ Always observe the following instructions. Failure to do so may result in electric shock or other dangers that may lead to serious injury or the loss of life.

1. During Measurement of Insulation Resistance
   • A high voltage is present at the probes. Do not touch the measured object or the earth or line terminal.
2. Immediately After Measurement of Insulation Resistance
   • The probes or the measured object may remain highly charged. Do not touch them immediately after the completion of measurement.
3. During Measurement of AC Voltages
   • Do not press the MEAS key while measuring AC voltages.
   • Voltage that exceeds the specified limit must not be applied to terminals.
4. Probes
   • Use the probes supplied by Yokogawa M&C with this tester.
   • Do not use probes that have deteriorated or are defective.
   • Remove the probes from the measured object before attaching/detaching the probes to/from the tester.
5. Insulation of Casing
   • A puncture in the protective insulation may occur if there are any cracks or other damage in the casing as a result of the instrument having been dropped or knocked against another object. Do not use the instrument before taking the necessary remedial measures; ask the manufacturer to repair it.
6. The Measured Object
   • Turn off the power to the measured object before you begin measuring insulation resistance.
   • Avoid touching any electrified parts while using the tester in a location with live electricity. For safety, it is recommended that you use a pair of rubber gloves or other alternative means.
7. Operating Environment
   • Do not operate the tester in an atmosphere where any flammable or explosive gas is present.
   • Do not use the tester if there is condensation on it.
8. Disassembly
   • No person, except personnel from Yokogawa M&C, is authorized to disassemble this instrument.

2. Components



3. Measuring Functions and Additional Features

■ **Measuring Functions**
- Measuring the insulation resistance (four ratings)
  125 V/ 200 MΩ
  250 V/ 200 MΩ
  500 V/ 2000 MΩ
  1000 V/ 2000 MΩ
- Measuring AC voltages (sine wave at 45 to 400 Hz)
- Measuring conductor resistances (0 to 400.0 Ω)
  Continuity test (beeps for 40 Ω or less)

■ **Additional Features**
- Memory feature (data saving)
  Up to 20 measured values of the insulation resistance for each rating can be saved to memory.
- Live-line alarm
  When an AC voltage of 40 V or more is applied between the input terminals, the ALARM LED flashes and the buzzer beeps (except during AC voltage measurement).
- Comparator
  When a measured insulation resistance is less than the reference value setting, the LOW mark appears and the buzzer beeps.
- HOLD feature
  Measured insulation resistances are automatically held for approximately five seconds.
- High-voltage indication
  If a DC voltage exists between the terminals, the HV mark and the ALARM LED come on.
- Discharge feature
  The tester is designed to begin discharging when the MEAS key is turned off.
  It indicates the discharging status with a bar graph, and the HV mark and ALARM LED come on during discharging (and off when discharging is complete).
- Auto-power off
  The tester is automatically turned off when no key operations are performed for 10 minutes.
- LCD backlight
  The backlight can be turned on/off with the LIGHT key.
- Locking the MEAS key
  Pulling the MEAS key up allows for continuous measurement over a prolonged time.
- Lock for inadvertent setting of 1000-V range
  This mechanism protects the measured circuit from damage due to inadvertent measurement with the highest voltage (1000 V).

4. Overrange Display Functions

■ **OL Display**

The tester displays the OL mark when the measured resistance exceeds the following values.

Insulation resistance measurement:
For 1000 V and 500 V ratings: 2000 MΩ
For 250 V and 125 V ratings: 200 MΩ

Conductor resistance measurement: 400 Ω

■ **∞Display**

The tester displays the ∞ mark when the internal calculation exceeds the following values.

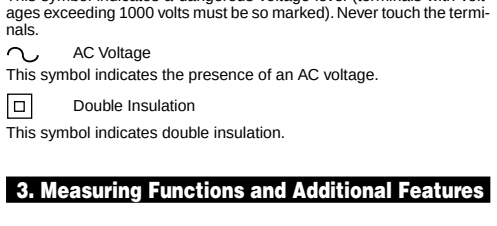
Insulation resistance measurement:
For 1000 V and 500 V ratings: approx. 4000 MΩ
For 250 V and 125 V ratings: approx. 400 MΩ

■ **Change to Upper/Lower Ranges**
- To upper range
  When the digital reading exceeds 4000, the measuring range changes to the next upper range.
- To lower range
  When the digital reading falls below 360, the measuring range changes to the next lower range.

■ **Lower Resolution Display**

If the digits below the decimal point are not stable, they can be automatically omitted to limit the resolution.

5. Display Functions



HOLD Lit when the measured insulation resistance is being held.

Flashes when the battery voltage is low.

1000V Lit when the rating setting is 1000 V/2000 MΩ.

500V Lit when the rating setting is 500 V/2000 MΩ.

250V Lit when the rating setting is 250 V/200 MΩ.

125V Lit when the rating setting is 125 V/200 MΩ.

OL Indicates overrange.

Indicates the extension bar graph.

The extension bar graph shows how the measured value is changing (trend) as follows:

Note that the number of ◀ ▶ marks means the degree of change.

▶▶▶ : Change toward smaller values

◀◀◀ : Change toward larger values

◀▶ : Stable

HV Lit when:
- Pressing the MEAS key in insulation resistance measurement; and
- Residual electrical charges are present during discharging.

COMP Lit when the comparator is activated.

LOW Lit when the measured insulation resistance is lower than the comparator setting value.

MEM Lit when the memory feature is in use.

~V Indicates the unit for AC voltage measurement.

MΩ Indicates the unit for insulation resistances.

Ω Indicates the unit for conductor resistance measurement.

●))) Indicates the continuity mark, which is lit when the measured insulation resistance is lower than 40 Ω.

Sub-display

8888 Indicates:
- Comparator setting value or the storage number; or
- The storage number for memory.

MΩ Indicates the unit for insulation resistance for comparator.

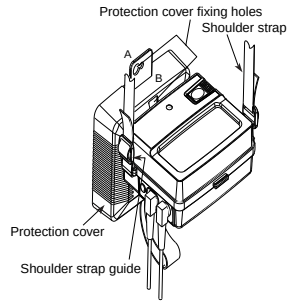
6. Functions for Each Component

1. **Display window (LCD)**
   Displays the measured values and the function marks (see section 5, "Display Functions").
2. **MEAS key**
   Used for measuring the insulation resistance only.
3. **LIGHT key:** Used for turning on/off the backlight.
   (MEM key): Also used for setting memory.
   (Enter key): Also used for confirmation for the comparator and memory functions.
4. **Protective cover fitting**
5. **COMP key:** Used for setting the comparator.
   (Select key): Also used for selection for the comparator and memory functions.
6. **ALARM LED**
   Flashes for the live-line alarm, and is lit as a warning for the high-voltage alarm.
7. **Function switch**
   A rotary switch for setting measurement ratings with the following positions:
   - 1000 V/ 2000 MΩ: Insulation resistance measurement
   - 500 V/ 2000 MΩ: Insulation resistance measurement
   - 250 V/ 200 MΩ: Insulation resistance measurement
   - 125 V/ 200 MΩ: Insulation resistance measurement
   - AC voltage measurement (maximum input voltage: 600 V)
   - Power off
   - Conductor resistance measurement
     Continuity test
     CLr: Memory clear
8. **1000-V RELEASE button**
   Turn the function switch to the 1000 V rating position while pressing this button.
9. **Battery cover setscrew**
   Undo to replace batteries.
10. **Battery cover**
11. **Shoulder strap guide**
    The shoulder strap is passed through it.
12. **Earth terminal**
    Connection for earth probe.
13. **Line terminal**
    Connection for line probe.

Note
- GUARD function is not a standard function.

7. Using Protection Cover and Shoulder Strap

The tester comes with a protection cover and shoulder strap as standard accessories.
- The protection cover can be used as a front cover (for the display window) or as a bottom cover. (It is set as the front cover when delivered from the factory.)
- Using the shoulder strap allows you to position the tester in front of your chest for ease of reading. Pass the strap through the shoulder strap guide and adjust the length of the strap to allow you a good view of the tester.
- Remove the cover from the front, and attach it to the bottom using the fixing hole (B) on the surface of the cover. This is useful when the diaplay is too close to your body to see clearly (See the figure on the right).
- A belt on the cover which is fitted with pieces of Velcro, can be used to store the probes (Remove the probes from the tester terminals when storing them).



8. Before Measurement

1. **Safety**
   - Read the handling precautions in this manual carefully.
   - Make sure it is safe before starting measurement.
2. **Battery Voltage Verification**
   - Make sure that the battery voltages are within the valid ratings (i.e. the ± mark is not flashing).
   - If the batteries are low, replace them as specified in the battery replacement section of this manual.

Note

As the ± mark indication depends on the load (current consumption), check that the ± mark does not appear for the largest load when short-circuiting the earth probe and the line probe (0 MΩ).

3. **Connecting the Probes**
   - Plug the earth probe into the earth terminal.
   - Plug the line probe into the line terminal.

⚠ WARNING
- Remove the probes from the measured object before attaching/detaching the probes to/from the tester.
- Make sure the MEAS key is off when attaching/detaching the probes to/from the tester.

4. **Function Switch Verification**
   Be sure to confirm that the function switch is set to the desired rating.
5. **1000-V Rating**
   When measuring with the 1000-V rating, see section 12, "Double-action 1000-V Function".

9. Battery Replacement

⚠ WARNING
- Remove the probes from the tester and then turn off the MEAS key before opening the casing to replace the batteries.
- Do not touch the MEAS key during replacement. Otherwise, a high voltage may be produced.

1. Loosen the battery cover setscrew, and then slide the cover off of the main unit.
2. Replace all of the 4 batteries at the same time and make sure the polarities of the new batteries are exactly as shown on the battery holder.
3. After replacing the batteries, attach the battery cover and tighten the setscrew.

⚠ CAUTION
- Do not mix batteries of different types or new batteries with used ones.
- Always remove the batteries if the tester will not be used for a prolonged period of time. If you store the tester with the batteries left installed, fluid is likely to leak from them, resulting in a malfunctioning of the instrument.

10. Battery Life (Reference only)

For MY40 at rated 500 V/2000 MΩ:
Approximately 15 hours when in continuous operation with center value indicated (approx. 50 MΩ; with standard supplied batteries).

Note

The data above is typical. Nevertheless, the battery life varies depending on the operating conditions. Check the batteries before measurement.

11. Measuring the Insulation Resistance

1. Before Connecting the Probes

⚠ WARNING

- Turn off the power to the measured object before connecting or measuring insulation resistance.
- Electrical charges may be present in the cables attached to or metal of the electrical equipment being tested. Verify that the equipment is free from electrical charges before connecting the testing terminals.
- Be sure to confirm that the function switch is set to the desired rating.

Insulation resistance ratings:
125 V/ 200 MΩ
250 V/ 200 MΩ
500 V/ 2000 MΩ
1000 V/ 2000 MΩ

2. Setting the Function Switch
Turn the function switch to the desired measurement rating position. The initial display is "---- MΩ".

3. Connecting the Earth Probe
- If the measured object is grounded, connect the earth probe clip to the measured object's ground line.
- If the measured object is not grounded, this process may be omitted.

4. Connecting the Line Probe
- Bring the line probe into contact with the measured object, and then press the MEAS key. The display indicates the insulation resistance of the measured object.

Note

During measurement, exercise care to prevent the leadwire of the line probe from coming into contact with the ground, floor or any other object. Not observing this precaution may result in a failure to measure the correct insulation resistance.

5. After Measurement

⚠ WARNING

- Immediately after measurement, electrical charges resulting from the applied testing voltage may remain present in the probes or measured object.
- The tester, therefore, is designed to automatically begin discharging electricity upon completion of measurement. Verify that the ALARM LED turns off when discharging is complete.

12. Double-action 1000-V Function

The tester is equipped with the RELEASE button to protect the measured circuit from damage due to inadvertent measurement at 1000 V. To select the 1000 V rating, turn the function switch to the position while pressing this button. To cancel the 1000 V rating, turn the function switch to the off position or another rating position.

13. Live-line Alarm

Always turn off the power to the measured object before connecting or measuring insulation resistance. If an AC voltage of more than 40 V is applied, the ALARM LED flashes and the buzzer beeps. In this case, stop the measurement immediately and check the power supply voltage.

14. Locing the MEAS Key (for Continuous Measurement)

The MEAS key, when pulled up to the right, can be locked to ensure the key remains turned on. Use this mechanism when making continuous measurement over a prolonged period. Note, however, that leaving the key turned on for an unreasonably long time will accelerate the discharge of the batteries.

15. HOLD Feature

Measured insulation resistances are automatically held for approximately five seconds. Turning off the MEAS key initiates holding.

16. Measuring AC Voltages

⚠ WARNING

- **Do not press the MEAS key while measuring AC voltages.**
- Voltage that exceeds the specified limit (600 V) must not be applied to terminals. Doing so causes all digits of the measured voltage to flash and the buzzer to beep.

1. Setting the Function Switch
Turn the function switch to an AC voltage measurement (~V) position.

2. Connecting the Earth Probe
- If the measured object is grounded, connect the earth probe clip to the measured object's ground line.
- If the measured object is not grounded, this process may be omitted.

3. Connecting the Line Probe
- Bring the line probe into contact with the measured object. The display indicates the AC voltage of measured object.

17. Measuring Conductor Resistance (Continuity)

The tester can measure the conductor resistance of 0-400 Ω. The buzzer beeps for resistances approximately 40 Ω or lower.

⚠ WARNING

- Turn off the power to the measured object before connecting or measuring conductor resistance.

1. Setting the Function Switch
Turn the function switch to a conductor resistance measurement (•)) Ω) position.

2. Connecting the Earth Probe
Securely connect the earth probe to the measured object.

3. Connecting the Line Probe
Bring the line probe into contact with the measured object. The display indicates the resistance of the measured object.

Note

You do not have to press the MEAS key when you measure conductor resistances.

18. Auto Power-off

The tester is automatically turned off when no key operations are performed for 10 minutes.
The buzzer sounds 9 and a half minutes after the last key operation (at 1-sec intervals). If any measurement or key operation is not made while the buzzer sounds, the tester is turned off. However, it is not turned off when measurement is in progress or an alarm occurs.

To use the tester after the auto power-off is triggered, press the LIGHT key or the COMP key, or turn the function switch to the off position once before proceeding with the desired operation.

19. LIGHT and COMP Keys

The COMP key is used as the Select key for settings and storage numbers of the comparator and memory functions.

The LIGHT key is used as the Enter key for settings and storage numbers of the comparator and memory functions. Pressing the Enter key while the display is flashing, confirms selection of the setting or the storage numbers.

- When setting the memory or comparator function
  Turn the function switch to an insulation resistance rating position while pressing and holding the LIGHT key or the COMP key until all the displayed digits stop flashing and remain on, and the buzzer sounds. Or position the function switch to a rating of the insulation resistance first, press the LIGHT key or the COMP key when all the digits appear, and hold the key until the buzzer sounds.

■ **Backlight**
- The backlight remains off while the comparator is set.
- The backlight is lit when memory is in use.

20. Memory Feature (Data Saving)

Up to 20 measured values of the insulation resistance for each rating can be saved to memory.

■ **Displaying data**
(1) Turn the function switch from power-off to a measurement rating while pressing and holding the LIGHT key (MEM).
"MEM" appears and "no.01" (storage number) flashes on the sub-display.
(2) Select a storage number.
Press the COMP key (Select) to select a storage number (no.01 to no.20).
If an insulation resistance data is saved with the selected (displayed) number, the insulation resistance value is displayed.
If any data is not saved with the selected (displayed) number, "----" is displayed.

■ **Saving data**
First select a storage number as in steps (1) and (2) above. Overwriting data is possible.
(3) Perform measurement with the MEAS key.
(4) Turn off the MEAS key. The measured value is held and starts flashing. Press the LIGHT key (Enter) while the measured value is flashing to save it to memory (it is held for five seconds in which time the next data cannot be saved).

Note

If the data being held is invalid, "----" is displayed and it cannot be saved. In this case, perform measurement again and save the data.

■ **Deleting data**
Data saved can be collectively deleted.
(1) Turn the function switch from power-off to the continuity test position (Clr) while pressing and holding the LIGHT key (MEM).
(2) "MEM" and "CLr" appear.
(3) Press the LIGHT key (MEM). "CLr" starts flashing.
(4) Press the LIGHT key (MEM) again while "CLr" is flashing. The buzzer sounds and all data are deleted (do not change the position of the function dial for two seconds when "CLr" is displayed). The tester changes its mode to measurement of conductor resistances.

Note

To stop deleting of data:
Do not perform any key operation and wait for 10 seconds while the "CLr" indication mentioned in step (3) is flashing; or
Turn the function switch to another rating.

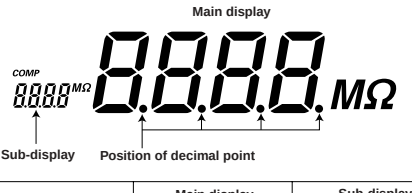
■ **Turning off the memory feature**
Turn the function switch to the off position.

21. Comparator

When a measured insulation resistance is less than the reference value setting, the LOW mark appears and the buzzer sounds. Also the measured value is automatically held for 5 seconds.

■ **Selecting the reference value**
Select from three preset values for each rating.
Default values:
no.01: 0.1 MΩ/ no.02: 0.2 MΩ/ no.03: 0.4 MΩ
(1) Turn the function switch to a measurement rating.
(2) Press the COMP key.
(3) ***COMP*** appears and the reference value appears on the sub-display.
(4) Pressing the COMP key (Select) changes the reference value display as follows.
0.1 MΩ / 0.2 MΩ / 0.4 MΩ / Comparator off (no display)
The reference value currently displayed is selected as the comparator setting.

■ **Setting the preset values**
Each of the default preset values no.01 to no.03 can be changed independently.
(1) Turn the function switch from power-off to a desired rating while pressing and holding the COMP key. "no.01" on the sub-display flashes. Press the COMP key (Select) to select no.02 or no.03.
(2) Confirm the setting no. with the LIGHT key (Enter).
The reference value on the main display can be set.
(3) Select the position of the decimal point with the COMP key (Select).
(4) Confirm the decimal point with the LIGHT key (Enter).
(5) Select the number for each digit sequentially.
Pressing the COMP key (Select) changes the number as follows.
0 → 1 → 2 ··· 8 → 9 → 0



	Main display	Sub-display
Insulation resistance measurement (with comparator)	Measured value	Reference value
Comparator setting	Reference value	no.

(6) Confirm the number with the LIGHT key (Enter).
(7) Set the number for the next digit.
(8) When settings for all the digits are complete, the reference value starts flashing.
(9) Confirm the reference value with the LIGHT key (Enter). The buzzer sounds and the setting ends. The tester changes its mode to measurement of insulation resistances.

Repeat steps (1) to (9) to change other preset values.

Note

- To cancel the preset setting
  Pressing the COMP key (Select) in step (8) returns the setting procedure to step (1). To stop the setting, turn the function switch to the off position.
- To set the preset values for another rating
  Turn the function dial to the desired rating (insulation resistance) in step (8).

22. Specifications (JIS C1302-1994 compliance)

Rating	125V/200 MΩ	250V/200 MΩ	500V/2000 MΩ	1000V/2000 MΩ
Center Value Indicated (MΩ)	5	5	50	50
1st Effective Measuring Range (MΩ)	.0200 to 10.00	.0500 to 20.00	1.000 to 500	2.000 to 1000
2nd Effective Measuring Range Lower Limit (MΩ)	0 to.0199	0 to .0499	0 to .999	0 to1.999
2nd Effective Measuring Range Upper Limit (MΩ)	10.01 to 200	20.01 to 200	501 to 2000	1001 to 2000
Lower Measuring Limit of Resistance (MΩ)	0.125	0.25	0.5	2
Rated Current (mA)	1 to 1.2	1 to 1.2	1 to 1.2	0.5 to 0.6
AC Voltage Measuring Range (V)	0 to 600			

Tolerances under the above conditions
Insulation resistance measurement:
±(2% of rdg + 6 dgt) within the 1st effective measuring range
± (5% of rdg + 6 dgt) within the 2nd effective measuring range (Lower limit)
±(5% of rdg) within the 2nd effective measuring range (Upper limit)
Zero value indicated: 6 dgt max.
AC voltage: ±(2% of rdg + 6 dgt)
Conductor resistance measurement: ±(2% of rdg + 8 dgt)
No-load voltage: within 130% of the rated voltage
Short-circuit current: 2 mA or less

Standard test conditions
Ambient temperature and humidity: 23 ±5°C at 45 to 75% RH
Position: Horizontal (within 5 degrees)
Influence of external magnetic field: Earth magnetism
Battery voltage: Within effective range of the battery (the ⊣⊢ mark must not be indicated.)

Item	Limit	Test condition
Response time	Digital indication: 3 sec or less Bar graph indication (static) value: approx. 2 sec	From the instant the resistors whose values correspond to central indication and zero indications are abruptly connected, to when the pointer reaches a level within tolerance
Effect of temperature	± 2% or less	1st effective measuring range: maximum, center, and minimum indicated values Deviation from those values when ambient temperature is varied from 20°C by ± 20°C.
Effect of humidity	Within tolerance	When the tester is left for 1 hour with the humidity at 90% RH
Effect of external magnetic field	3% or less of indication	The change of indication when an external field of 400 A/m DC is applied in the most affected direction
Effect of AC component of voltage at measuring terminals	10% or less of indication	A change when a capacitor with 5 μF ±10% is connected in parallel to a resistor corresponding to central indication connected
Insulation resistance	50 MΩ or more (between electric circuits and outer case)	When a voltage of 1000 V is applied.
Withstand voltage	There must not be an abnormality (between electric circuits and outer case).	When a sine wave, or the like, is applied between the electric circuits and the outer case at 5550 V AC and 50/60 Hz for 1 minute
Resistance to vibration	There are no mechanical and electrical damage. The specifications for tolerances must be met.	When a vibration frequency of 16.7 Hz and peak-to-peak amplitude of 4 mm is applied in the direction of the axis of the moving part for 1 hour
Resistance to shock	There are no mechanical and electrical damage. The specifications for tolerances must be met.	When shock of 1000 m/s² is applied twice in the direction of axis of the moving part and in a direction perpendicular to the axis
Endurance	The specifications for tolerances must be met.	When a resistor corresponding to the central indication is connected across the measuring terminals and the power switch is repeatedly turned on and off 10 000 cycles at a rate of about 300 cycles/hour
Protection against mistaken input	There must not be an abnormality.	When an AC voltage of 50/60 Hz at 1.2 times the rated measuring voltage is applied to the measuring terminals for 10 seconds

23. General Specifications

Operation temperature and humidity	0°C to 40°C at 90% RH or less (no condensation)
Storage temperature and humidity	–10°C to 60°C at 70% RH or less (no condensation)
Battery	Four AA-size (R6)
External dimensions	Approx. 125 (W) × 103 (H) × 52.5 (D) mm
Weight	Approx. 420 g (main unit and batteries only) Approx. 600 g (main unit, batteries, protective cover, earth probe and line probe)

Safety standards	EN61010-1:1993 and EN61010-2-31:1995 Insulation class Ⅱ ,Pollution degree 2 Overvoltage category Ⅲ (maximum input voltage: 600 V)
EMC standards	EN55011; 1998 Group1 ClassB EN61326-1; 1997+A1; 1998
Effect of radiation immunity	At the strength of radio-frequency electromagnetic field of 3V/m • Insulation resistance measurement 1st effective measuring range : ± (5% of rdg +12dgt) 2nd effective measuring range : ± (10% of rdg +12dgt) • AC Voltage measurement : ± (5% of rdg +12dgt) • Conductor resistance measurement : ± (10% of range)

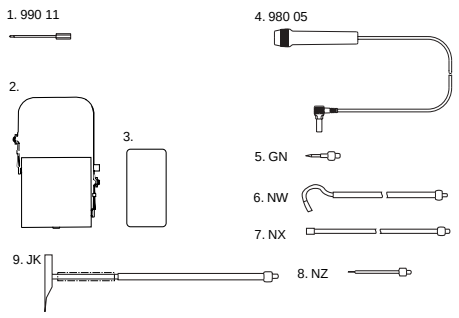
24. Accessories

■ **Standard Accessories**

Name	Model No.	Quantity
Protection cover	93013	1
Shoulder strap	99005	1
Line probe	98001	1
Earth probe	98002	1
Batteries	—	4
User's manual	IM MY40-E	1

■ **Optional Accessories**

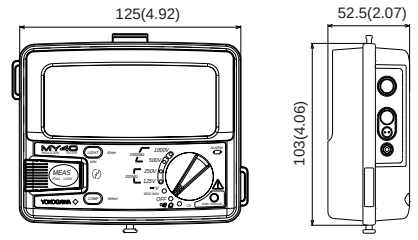
Name	Model No.	Description
1. Spare probe tip for the line probe (Model 98001)	99011	105 mm, breaker pin
2. Hard case	93015	Houses both the main unit, the line probe and the earth probe.
3. Accessory bag	B9108XA	Soft case, approx. 100 (W) × 190 (H) × 40 (D) mm
4. Replaceable-type line probe	98005	Cable length: 1000 mm
5. Spare probe tips for the line probe (Model 98005)	B9600GN	58 mm, general-purpose
6.	B9600NW	360 mm, hook-shaped
7.	B9600NX	360 mm, for extension purposes
8.	B9600NZ	108 mm, sharp-pointed
9.	B9635JK	338 mm, pickax-shaped



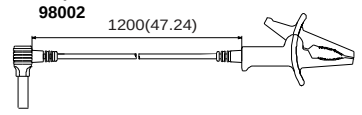
25. External Dimensions

Unit: mm
(apptox. inch)

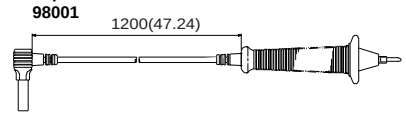
Main unit



Earth probe
98002



Line probe
98001



26. Maintenance

■ **Storage Conditions**
- Temperature and humidity:-10°C to 60°C at 70% RH or less
- Remove the batteries before storing the tester.
- Avoid storing the tester in a location where there is:
  moisture; exposure to direct sunlight;
  a high-temperature heat source nearby;
  exposure to severe mechanical vibrations;
  a large amount of dust and/or salt, or a corrosive gas.

■ **Removal of Dirt**
Do not use volatile solvents (such as paint thinners or benzine) as they are likely to cause discoloration. Wipe off dirt with a cloth dampened water or alcohol.

■ **Calibration Cycle**
It is recommended that the tester be calibrated once every year for correct operation; ask Yokogawa M&C to do the periodic calibration for you.

27. Corrective Measures in Case of Failure

If the instrument does not operate properly after taking the corrective measures shown below or any other failure that is not covered here occurs, contact the vendor from which you purchased the instrument.

Failures
- The tester displays nothing after turning the function switch to the on position.
- The display is light in color.
- The measured values are erroneous.

Items to Check
- The batteries are installed properly and their power levels are not low.
- The measuring probes are connected correctly and are not damaged.
- Whether the failure reoccurs after turning off the power and retrying the operation.

Error Messages
Err.0: An internal operation failure.
Turn off the power and retry the operation.
* If the failure reoccurs, the tester needs repairing.
Err.1: Cannot save the comparator or memory settings.
Measurement functions other than the comparator and memory functions operate normally.
Settings and data saved without the error indication (Err.1) can be used.
* If the failure reoccurs, the tester needs repairing.
Err.2: An internal operation failure.
Turn off the power and retry the operation.
* If the failure reoccurs, the tester needs repairing.

■ **About This Manual**
The contents of this manual are subject to change without prior notice. Under absolutely no circumstances may the contents of this manual be transcribed or copied, in part or in whole, without obtaining permission.
Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention however, please inform Yokogawa M&C Corporation accordingly.

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